REMARKS

The Application has been carefully reviewed in light of the Office Action dated January 2, 2003. Claims 1 to 18 are now pending in the application, with Claims 1, 3 and 5 to 8 having been amended, and Claims 10 to 18 having been added. Claims 1 and 10 are the independent claims herein. Reconsideration and further examination are respectfully requested.

It is noted that this amendment has been prepared in accordance with the Patent Office's revised format for amendments and therefore, where appropriate, waiver of the requirements of 37 C.F.R. § 1.121 is respectfully requested.

Claims 1 to 3, 7, and 8 were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,300,158 (Simburger) in view of U.S. Patent No. 6,262,558 (Weinberg), Claims 4 and 6 were rejected over Simburger and Weinberg and further in view of U.S. Patent No. 5,951,785 (Uchihashi), Claim 5 was rejected over Simburger and Weinberg and further in view of U.S. Patent No. 5,569,998 (Cowan), and Claim 9 was rejected over Simburger and Weinberg and further in view of U.S. Patent No. 4,409,537 (Harris). The rejections are respectfully traversed.

The present invention concerns controlling an electric current output to an output connector in a solar battery device. According to the invention, an output connector collects and outputs electric power that is input by an input connector, and electric power that is output by a power converter that converts electric power output by a solar battery. A detector detects the electric current value output to the output connector, and if the detected value exceeds a threshold value which is based on a maximum rated current value of the output connector or a current path to the output connector, a controller controls

output/operation of the power converter. As a result, the electric current output to the output connector is controlled so as not to exceed the maximum rated current value of the output connecter or the current path, thereby reducing the possibility of damaging the output connector and as a consequence, the solar battery device itself.

Referring specifically to the claims, amended independent Claim 1 is a solar battery device, comprising a solar battery, a power converter, arranged to convert electric power output from the solar battery, an input connector, arranged to input electric power from outside the device, an output connector, arranged to collect the electric power input by the input connector and the electric power output by the power converter, and output the collected electric power to outside the device, a detector, arranged to detect a current value of an electric current output to the output connector, and a controller, arranged to control output of the power converter when the current value detected by the detector exceeds a threshold value which is predetermined based on a maximum rated current value of the output connector or a current path of the output connector.

Newly-added independent Claim 10 includes features substantially corresponding to Claim 1, but is directed to a solar battery device which is electrically connectable to at least one other solar battery device in parallel.

The applied art, taken alone or in any permissible combination, is not seen to disclose or to suggest the features of Claims 1 and 10. More particularly, the applied art is not seen to disclose or to suggest at least the feature of controlling output/operation of a power converter that converts electric power output from a solar battery when a detected current value of an electric current output to an output connector exceeds a threshold value

which is predetermined based on a maximum rated current value of the output connector or a current path of the output connector.

The Office Action admits that Simburger fails to disclose or to suggest the foregoing features of Claims 1 and 10. Moreover, it is submitted that Simburger merely discloses a process for manufacturing multiple thin-film layer solar cells, but does not disclose anything with regard to the claimed power converter or current detector, much less controlling the power converter based on a detected current value of the output connector.

Weinberg's Fig. 11 is merely seen to disclose a current detector 211 that detects a battery charge current. A battery charge current reference 217 is used to set the amount of charge that is to be used for charging a battery 3. The reference value is used by an amplifier 213 to send a signal to switching logic 215 to control switches 207 of a second (battery charging) solar array 203 so as to control the amount of current used to charge the battery 3. The battery charge reference value is adjusted by an amplifier 122 based on an amount of user load 89. That is, a first solar array 201 supplies electric power necessary to meet the user load, but if the load exceeds the amount that can be produced by the first array 201, some of the power produced by the second (battery charging) array is diverted for use to satisfy the user load by actuating switches 221. To offset the diverted power, the battery charge reference is lowered by the amplifier 122 so that less power is used for battery charging, thereby providing more power to satisfy the user load. Thus, when the battery charge value is lowered and the current detected by the detector 211 exceeds the reference value, the amplifier sends a signal to the logic 215 to actuate the switches 207 so that less power is allocated for battery charging. Therefore, Weinberg merely detects an amount of current being used for battery charging, compares the detected value with a

reference value, and if the current being used to charge the battery exceeds the reference value, controls switches to reduce the amount of current used to charge the battery. However, Weinberg does not control a power converter, nor does Weinberg detect a current output to an output connector and control the power converter when the detected current value exceeds a threshold value which is predetermined based on a maximum rated current value of the output connector or a current path of the output connector.

Moreover, the structure and principle of operation behind controlling the switches of Weinberg is simply different from controlling the power converter of the present invention. In the present invention, the power converter is controlled so that the total current output to the output connector by both the input connector, and the power output by the power converter, does not exceed a maximum rated value of the output connector so as to reduce the possibility of damaging the output connector. In Weinberg, the current being controlled is for power that is supplied for charging a battery so as to allow power to be diverted for use to satisfy a user's load demand. Thus, Weinberg's current detection is based on an amount of current to be used for battery charging, regardless of a rated value of any output connector or current path. In addition, Weinberg controls switches to direct power from solar cells to either a charging section or to a user load section, but does not control a power converter that converts electric power output from a solar battery. Therefore, Weinberg is simply structurally and operationally different from the claimed invention of Claims 1 and 10.

Uchihashi, Cowan and Harris have been studied, but are not seen to add anything to overcome the deficiencies of Simburger and Weinberg. In particular, Uchihashi, Cowan, and Harris, like Simburger and Weinberg, are not seen to disclose or to

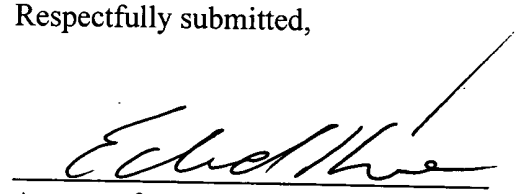
suggest at least the feature of controlling output/operation of a power converter that converts electric power output from a solar battery when a detected current value of an electric current output to an output connector exceeds a threshold value which is predetermined based on a maximum rated current value of the output connector or a current path of the output connector.

Finally, Applicants note that the Office Action comments on process claims at page 7, paragraph 10. However, since the present application does not include process claims, it is believed that this reference is merely a typographical error. Nonetheless, the Examiner is requested to clarify this matter in the next communication.

In view of the forgoing amendments and remarks, the entire application is believed to be in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience.

Applicants' undersigned attorney may be reached in our Costa Mesa, California office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



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